

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

Title V/PSD Draft Permit No. V-03-051

RECMIX OF PA, INC.

GHENT, KENTUCKY

November 14, 2003

WILSON TAN, REVIEWER

Plant I.D. # 21-041-00042

Application Log # 56071

**SOURCE DESCRIPTION:**

Recmix of PA Inc, plans to construct and operate a stainless steel recovery (slag processing operation) plant on the North American Stainless (NAS) site in Ghent, KY. Recmix and NAS are considered to be a single source. Recmix itself is a minor source, but because it plans to take over the NAS slag processing operation (part of NAS PSD permit application), a Title V/PSD permit is required.

Recmix will process a maximum of 280,000 tons of slag per year from the NAS melt shop and produce stainless steel chips and a final aggregate. The estimated tonnage for processing by Recmix has been derived based on a formula which estimates the slag generated per ton of steel melted and refined. This ratio is derived from information provided by North American Stainless. The incoming slag (throughput) is estimated to have 8% to 13% moisture and the final aggregate exits the plant at about 18% moisture. The stainless steel chips produced by Recmix will be sold to NAS for remelting onsite. The final aggregate produced at the facility has several uses and approvals from states for beneficial use, including use as an agricultural liming agent and a mine buffering agent. No wastes other than municipal wastes are generated at the facility. The water that is used for the rod mill and ball mill for the size reduction of the slag is recycled and reused.

The primary processing performed by Recmix is its operation to remove stainless steel from stainless steel slag. Slag is transported to the Recmix facility by front-end wheel loaders and placed in stockpiles. All slag will be fed directly into the wet dressing plant (WDP) with only the oversized screened out to be processed by an onsite crusher. After crushing, the sized material is re-introduced into the WDP. The slag is transported from the raw slag stockpiles to the crusher and main processing building by front-end loader.

The stainless steel slag is processed to remove the stainless steel using a physical/gravimetric process that uses no chemicals for stainless steel removal. The slag is reduced in size in 2 mills within the slag processing building so it generally is in the size range of a fine sand or silt. The gravimetric process is then used to separate the stainless steel from the remainder of the slag that is limestone (Reclime). The metal is deposited in bins while the Reclime is first settled in a thickener and later further dewatered using vacuum filters.

A biodegradable flocculent is used in the thickener to improve the settlement of the Reclime. The biodegradable flocculent used in the thickener is provided to Recmix as a dry powder. The dry powder is mixed with water in measured portions to obtain the proper concentration for use.

The vehicles used to transport the slag and the Reclime, and the equipment used to process the stainless steel slag, require ongoing maintenance. Several waste streams are generated as part of the equipment and vehicle maintenance programs. These include empty raw material containers, oil-contaminated waste, and paint waste. Additionally, the filters used to dewater the Reclime are also generated as waste as part of normal vacuum filter maintenance.

### **COMMENTS:**

#### **1. Emission ID = AREA1 – Unpaved road:**

- Front-end loaders will be used to move slag and aggregate materials within the plant area. One loader works 24 hours a day and 365 days a year to process the slag generated by North American Stainless. The unpaved roadways will be watered to suppress dust (particulate matter) emissions and a control efficiency of 70% is taken into consideration in actual PM emissions calculation.
- Haul road emission factor (lbs/ton) =  $(2 \times D \times EF)/30$   
where, D = Distance traveled in miles = 0.1373 miles  
EF = PM<sub>10</sub> emission factor = 1.404 lbs/ Vehicle Miles Traveled (VMT) for D less than 0.25 miles
- Applicable regulations and requirements have been incorporated into the permit.

#### **2. Emission ID = AREA3 – Stockpiles:**

- The size and number of slag aggregate stockpiles changes throughout the year. Recmix anticipates the maximum inventory of slag aggregate on site that is subject to wind erosion to be 20,000 tons at any time.
- Control efficiency = 90% due to high moisture content.
- PM<sub>10</sub> emission factor = 0.04 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

#### **3. Emission ID = EQPT1, and EQPT2 – Raw slag handling:**

- Raw slag (280,000 tons per year) will be transported to the slag storage stockpile, and later to the plant-hopper using front-end loaders. Watering will be used to control particulate matter emissions and a control efficiency of 90% is taken into consideration in actual PM<sub>10</sub> emissions calculation.
- PM<sub>10</sub> emission factor,  
= Transportation to slag storage stockpile using front-end loader = 0.0001 lbs/ton
- Applicable regulations and requirements have been incorporated into the permit.

#### **4. Emission ID = EQPT3 – Raw slag handling:**

- Recmix plans to construct an enclosed tunnel (approximately 30'x20') which will extend from the face of the slag dump hopper building. The slag dump hopper will be enclosed in a building along with the sizing screen. The building will measure approximately 50'x25'. This tunnel, which connects to the slag dump hopper and

sizing screen building will not have a door, although there will be at least 10 feet of tunnel distance behind the loader when the dumping occurs. The profile of the tunnel will be such that the loader will cover much of the width and height, which will reduce the potential for emissions escaping the slag dump hopper area. Enclosure control efficiency of 90% is taken into consideration in actual PM<sub>10</sub> emissions calculation.

- PM<sub>10</sub> emission factor,  
= Receiving at the hopper = 0.00002 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

**5. Emission ID = EQPT4, EQPT5, and EQPT7 – Oversize slag handling:**

- The oversize slag accounts for 30% of the total slag or 84,000 tons per year. This material must be crushed to below 3 inches in diameter before it is fed to the plant.
- EQPT 4 – Transportation of oversize slag from separator stockpile to pre-crusher stockpile using front-end loader. Removal of oversize materials from the wet dressing plant will be enclosed inside a building. The front-loader will access the building to remove the oversize material through an opening, which will be covered by the loader after entering and will reduce the potential for emissions to escape through the opening during the transfer and load out. A control efficiency of 90% is taken into consideration in actual PM<sub>10</sub> emissions calculation.
- EQPT 5 – Transportation of oversize slag from pre-crusher to picking conveyer using front-end loader.
- EQPT 7 – Transportation of oversize slag from crusher to slag storage stockpile using front-end loader.
- PM<sub>10</sub> emission factor for each emission ID = 0.0001 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

**6. Emission ID = EQPT6 – Oversize slag handling:**

- Transportation of oversize slag from picking conveyer to crusher using conveyor.
- Control efficiency = 90% due to high moisture content.
- PM<sub>10</sub> emission factor = 0.003 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

**7. Emission ID = EQPT8 and EQPT9 – Slag skull handling:**

- Included in the oversize slag is slag skull, which accounts for 5% of the oversize slag material or 4,200 tons per year.
- EQPT 8 – Transportation of slag skull from skull picking storage pile to skull screening storage pile using conveyor. Watering will be used to control particulate matter emissions and a control efficiency of 90% is taken into consideration in actual PM<sub>10</sub> emissions calculation.
- EQPT 9 – Transportation of slag skull from skull screening storage pile to skull screener using conveyor.
- PM<sub>10</sub> emission factor for each emission point = 0.003 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

**8. Emission ID = EQPT11 – Crushing operation:**

- Recmix performs crushing operation in order to reduce the oversize slag material.

Ninety-five percent (95%) of the oversize material (79,800 tons/year) is sent to the crusher and reduced in size. The uncontrolled emissions from the crushing operation will be reduced by the use of a series of water mist sprays (control efficiency = 75.4%) at multiple locations within the crushing section of this unit.

- PM<sub>10</sub> emission factor = 0.0024 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

**9. Emission ID = EQPT12 – Slag skull screening:**

- Recmix performs screening operations on the slag skull that is removed in order to remove dirt crusted onto the skull. Once the skull material is screened it is washed in place to remove any remaining dirt particles.
- Control efficiency = 90% due to high moisture content.
- PM<sub>10</sub> emission factor = 0.0015 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

**10. Emission ID = EQPT13 and EQPT14 – Rod Mill & Ball Mill:**

- The Rod/Ball Mill is used for size reduction of the stainless steel slags. This is a wet process that is enclosed within the Stainless Steel Recovery Facility building. There are no significant emissions associated with the Rod/Ball Mill operations due to the wet process, and because there are no discharge stacks or outside air exhaust points for the operation.
- Applicable regulations and requirements have been incorporated into the permit.

**11. Emission ID = EQPT15 – Mechanical Screen:**

- Recmix proposes to install a Reclime mechanical screen within 18 months of the issuance date of the permit. The screen is used to process Reclime to improve the material handling characteristics for subsequent use by farmers and various other individuals. The Reclime produced by Recmix typically has moisture content of about 18 percent by weight. The Reclime is stockpiled from the processing activities. At this moisture content, the Reclime is sufficiently wet that material handling is difficult, and there can be some issues (such as large clumps forming) during spreading the liming material on the land for agricultural uses.

**12. Emission ID = EQPT16 – Final Aggregate Handling:**

- Transportation of final aggregate slag (maximum of 266,000 tons/year) from exit pile to final storage using front-end loader.
- Control efficiency = 90% due to high moisture content.
- PM<sub>10</sub> emission factor = 0.0001 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

**13. Emission ID = EQPT17 – Final aggregate handling:**

- Transportation of final aggregate slag (maximum of 266,000 tons/year) from wet dressing plant to exit pile using conveyor. The final aggregate exits the wet dressing

plant at between 18% to 22% moisture. The amount of final aggregate is equal to the amount of raw slag input to the plant minus the 5% metals that are removed. This equals 266,000 tons of final aggregate that is handled annually. The physical characteristics of the final aggregate are silt and fine sand-sized materials.

- Control efficiency = 90% due to high moisture content.
- PM<sub>10</sub> emission factor = 0.003 lbs/ton.
- Applicable regulations and requirements have been incorporated into the permit.

#### **EMISSION AND OPERATING CAPS DESCRIPTION:**

Plant-wide PM<sub>10</sub> emissions shall not exceed 3.52 tons per year, as calculated in North American Stainless PSD permit application.

#### **PSD Increments:**

Pollutant	Particulate Matter <sub>10</sub> (µg/m <sup>3</sup> )	
AveragingTime	Annual Arithmetic Mean	24 Hour Maximum
Increment Allowable	17	30
Predicted Consumption	3.72	17.16

#### **CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or record keeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.